LIVING BREAKWATERS CAC MEETING

05/xx/2021

Governor's Office of Storm Recovery

DESIGN

SCAPE
COWI
ARCADIS
SeArc Ecological Marine Consulting
WSP
MES

CONSTRUCTION MANAGEMENT

RAMBOLL
Baird. Innovation Engineered.

CONSTRUCTION

WEEKS

WELCOME!

LIVING BREAKWATERS

Spring 2021

AGENDA

Project Overview

Status Update

Design Changes

Budget

Construction Schedule

Q&A

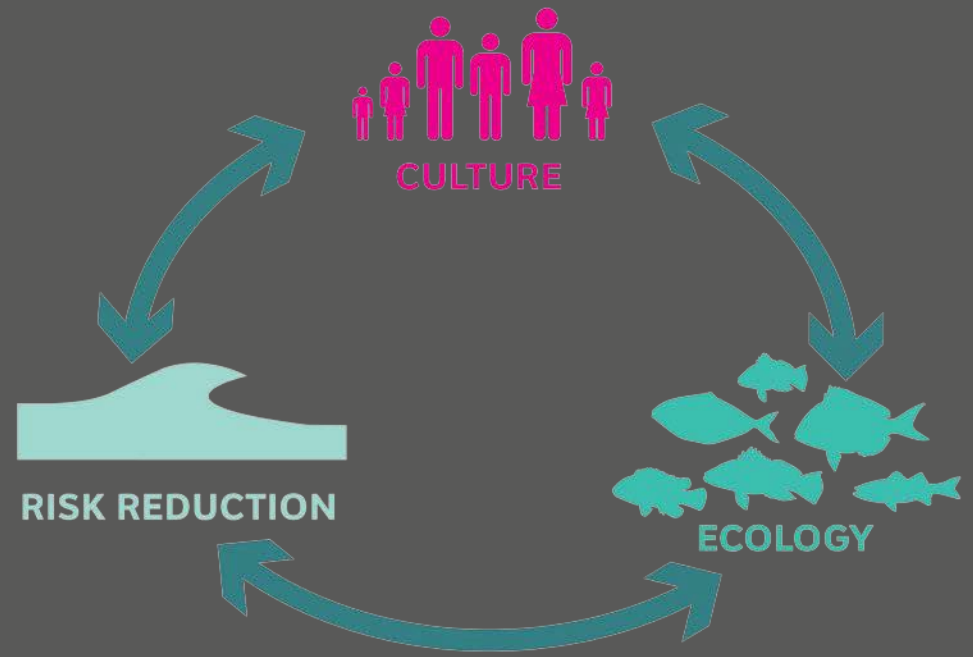
Project Overview (recap)

GOALS:

Reduce Coastal Risk
(erosion + storm waves)

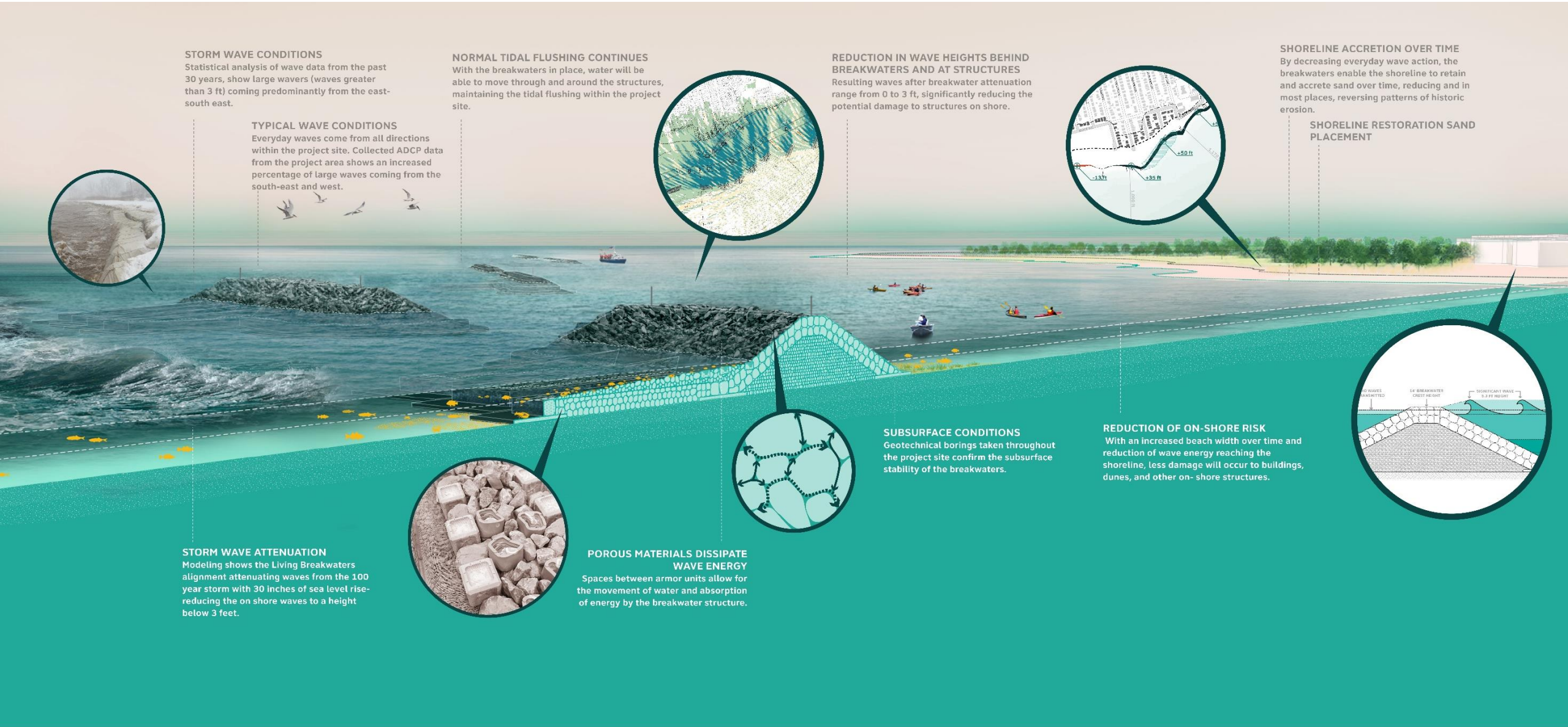
Enhance Ecosystems
(near-shore & shoreline habitats)

Foster Social Resilience
(education, stewardship, public water access)



LIVING BREAKWATERS

Engineered to reduce risk and create habitat



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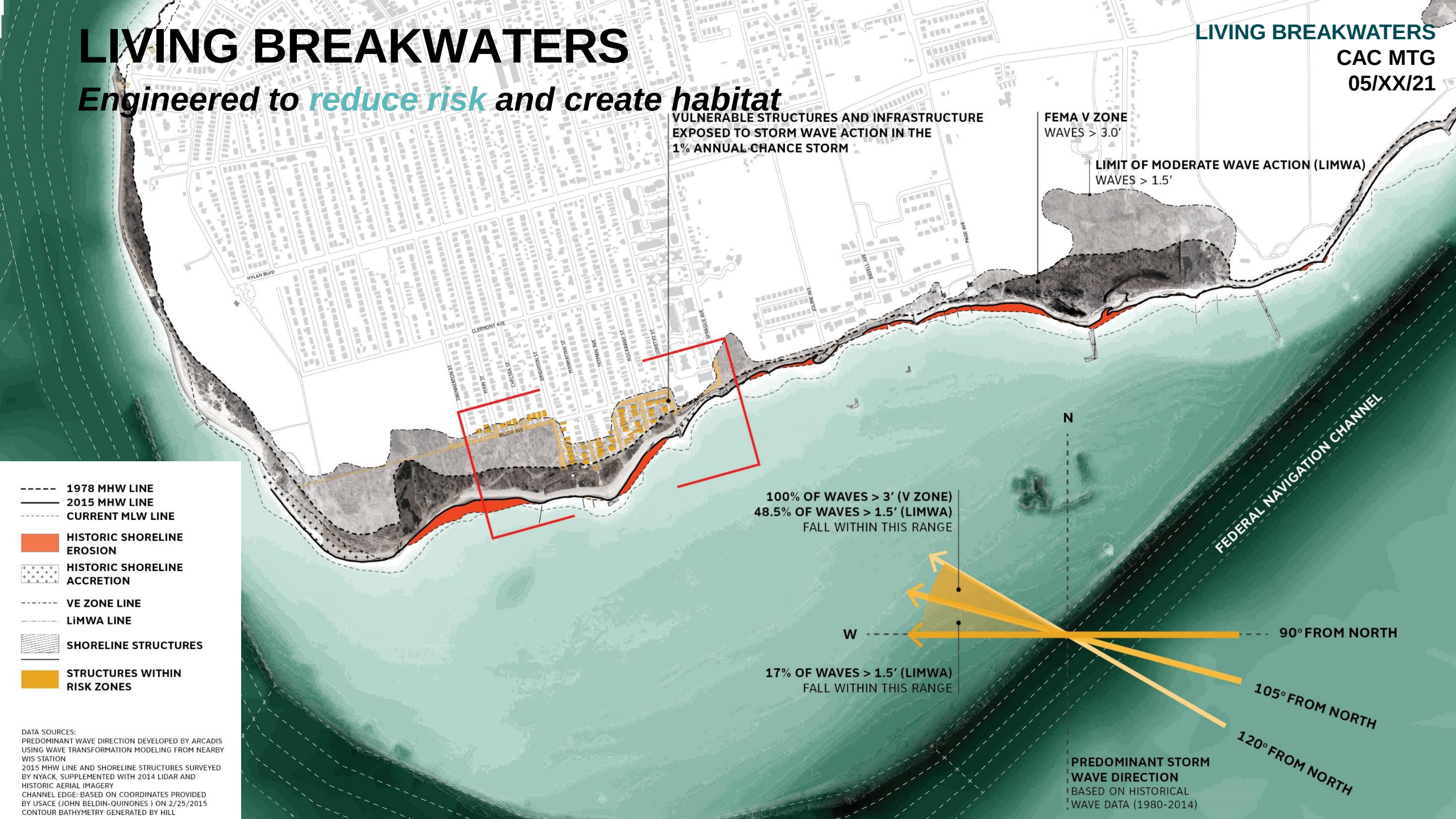

DATA SOURCES:
PREDOMINANT WAVE DIRECTION DEVELOPED BY ARCADIS USING WAVE TRANSFORMATION MODELING FROM NEARBY WIS STATION
2015 MHW LINE AND SHORELINE STRUCTURES SURVEYED BY NYACK, SUPPLEMENTED WITH 2014 LIDAR AND HISTORIC AERIAL IMAGERY
CHANNEL EDGE: BASED ON COORDINATES PROVIDED BY USACE (JOHN BELDIN-QUINONES) ON 2/25/2015
CONTOUR BATHYMETRY GENERATED BY HILL

LIVING BREAKWATERS

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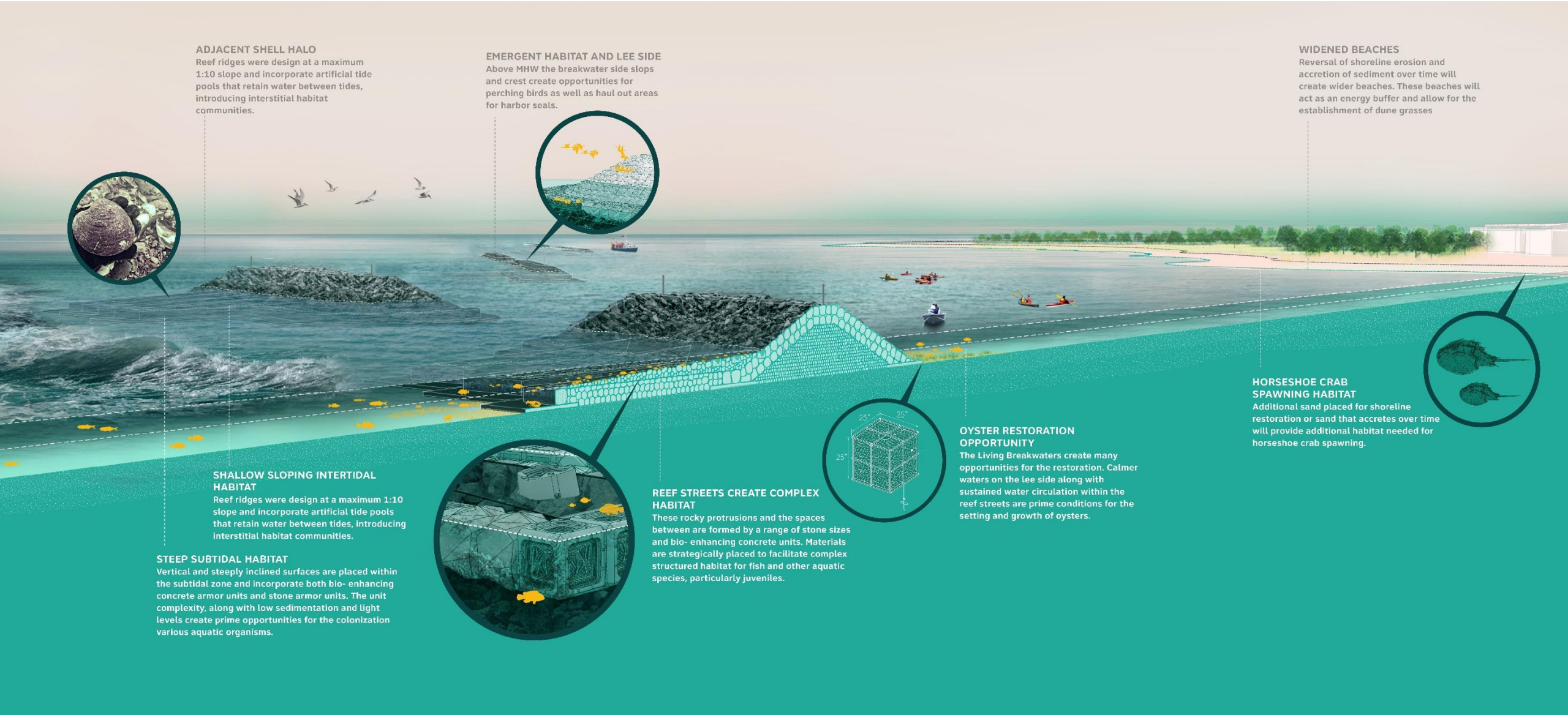

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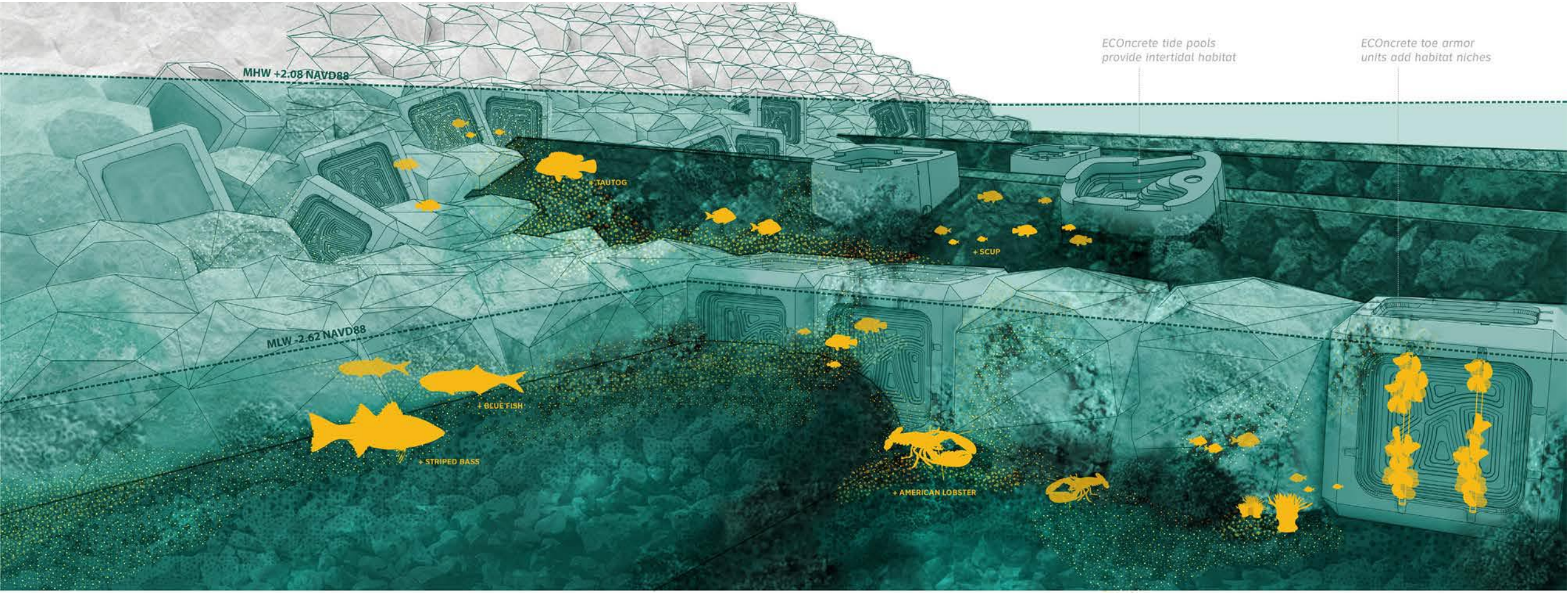

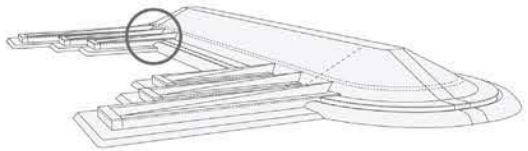

LIVING BREAKWATERS + OYSTERS

The Billion Oyster Project

LIVING BREAKWATERS COMMUNITY

Involvement, Education & Engagement

LIVING BREAKWATERS COMMUNITY

Community Advisory Committee – THANK YOU!

Status Update:
Construction Schedule

PROJECT TIMELINE

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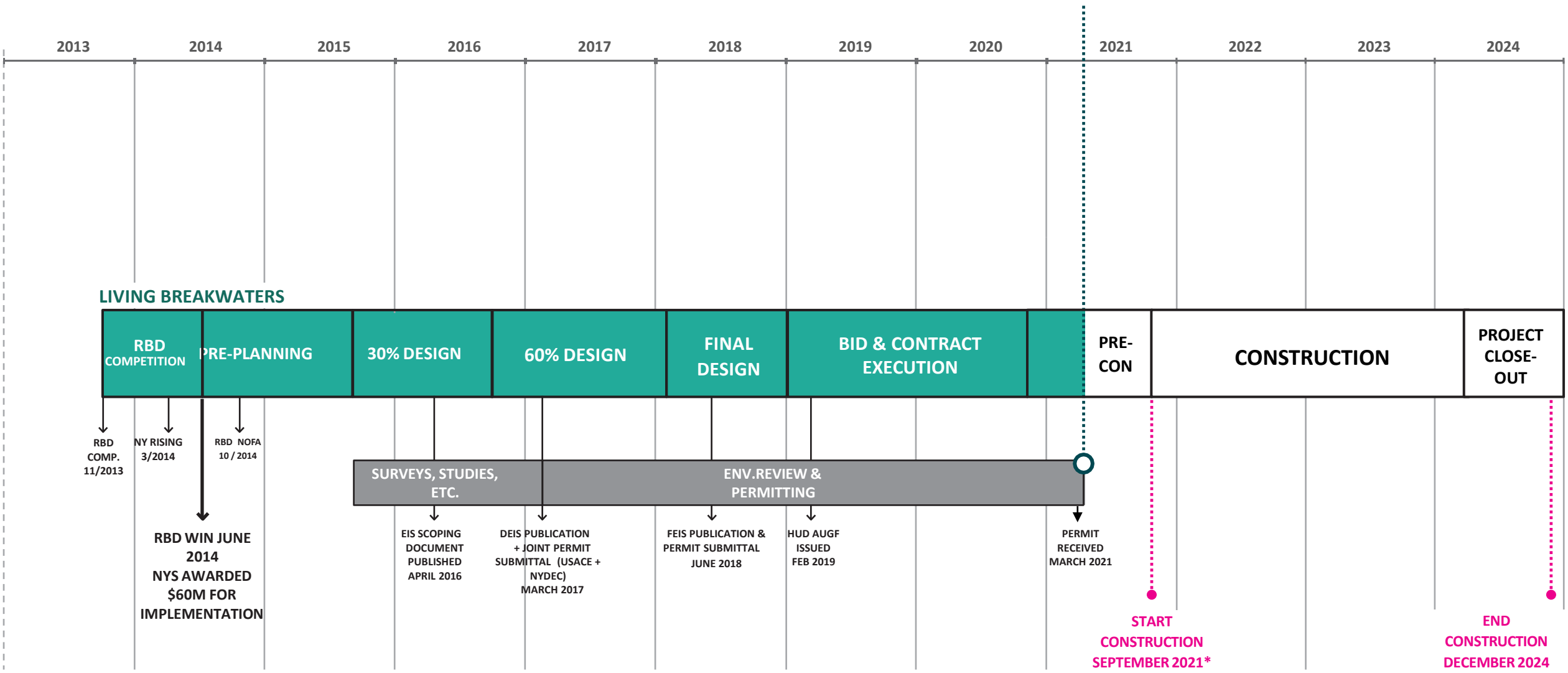

PROCUREMENT TIMELINE

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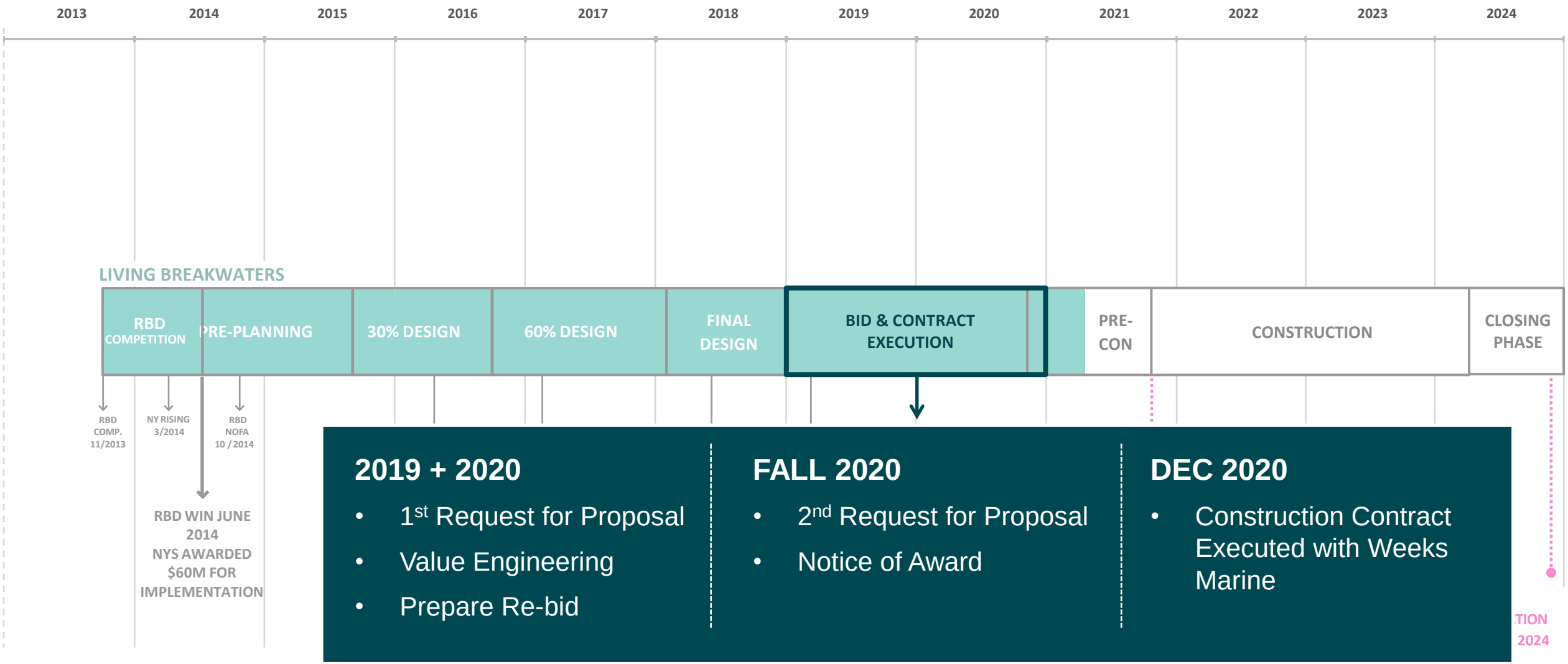
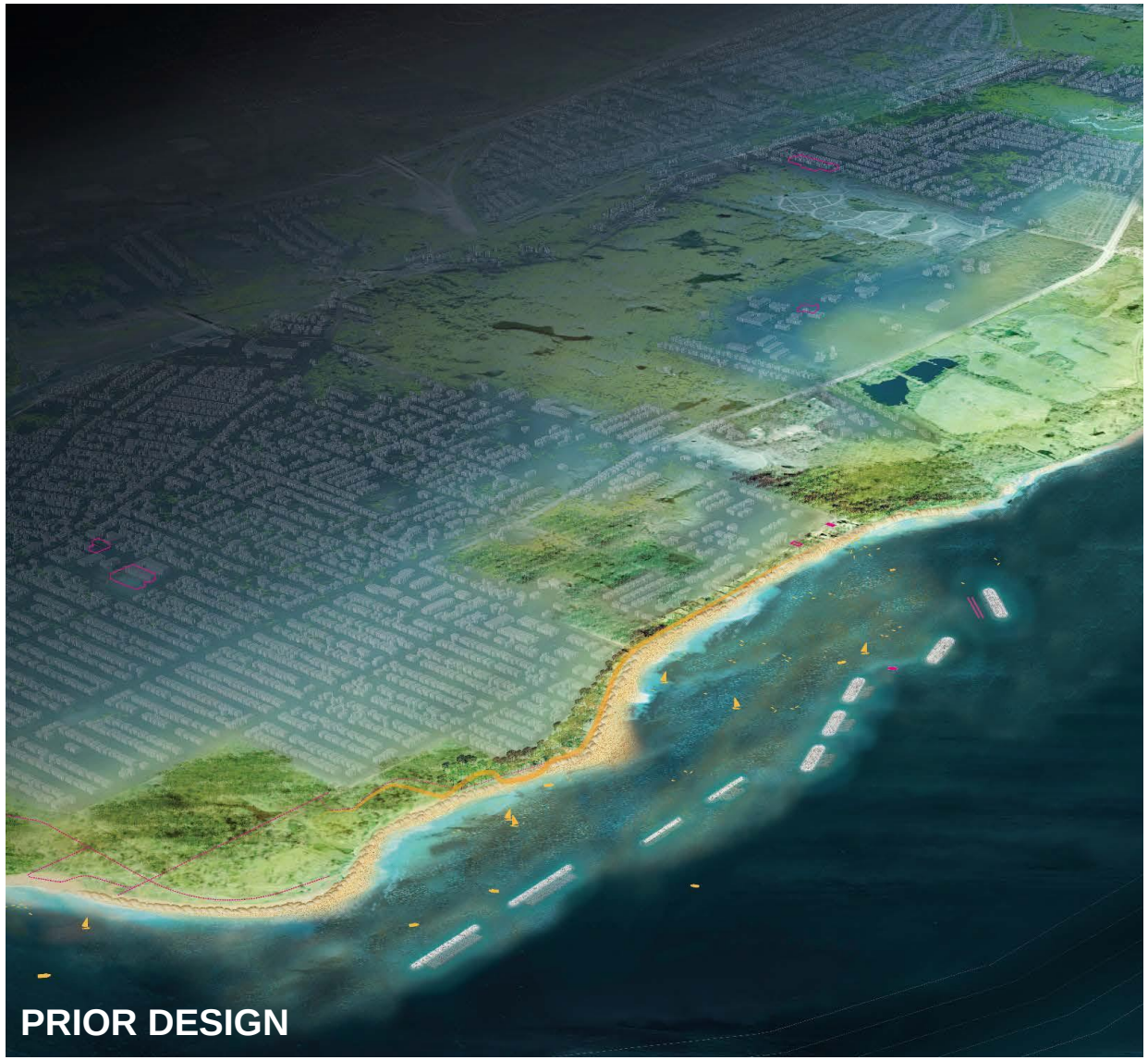
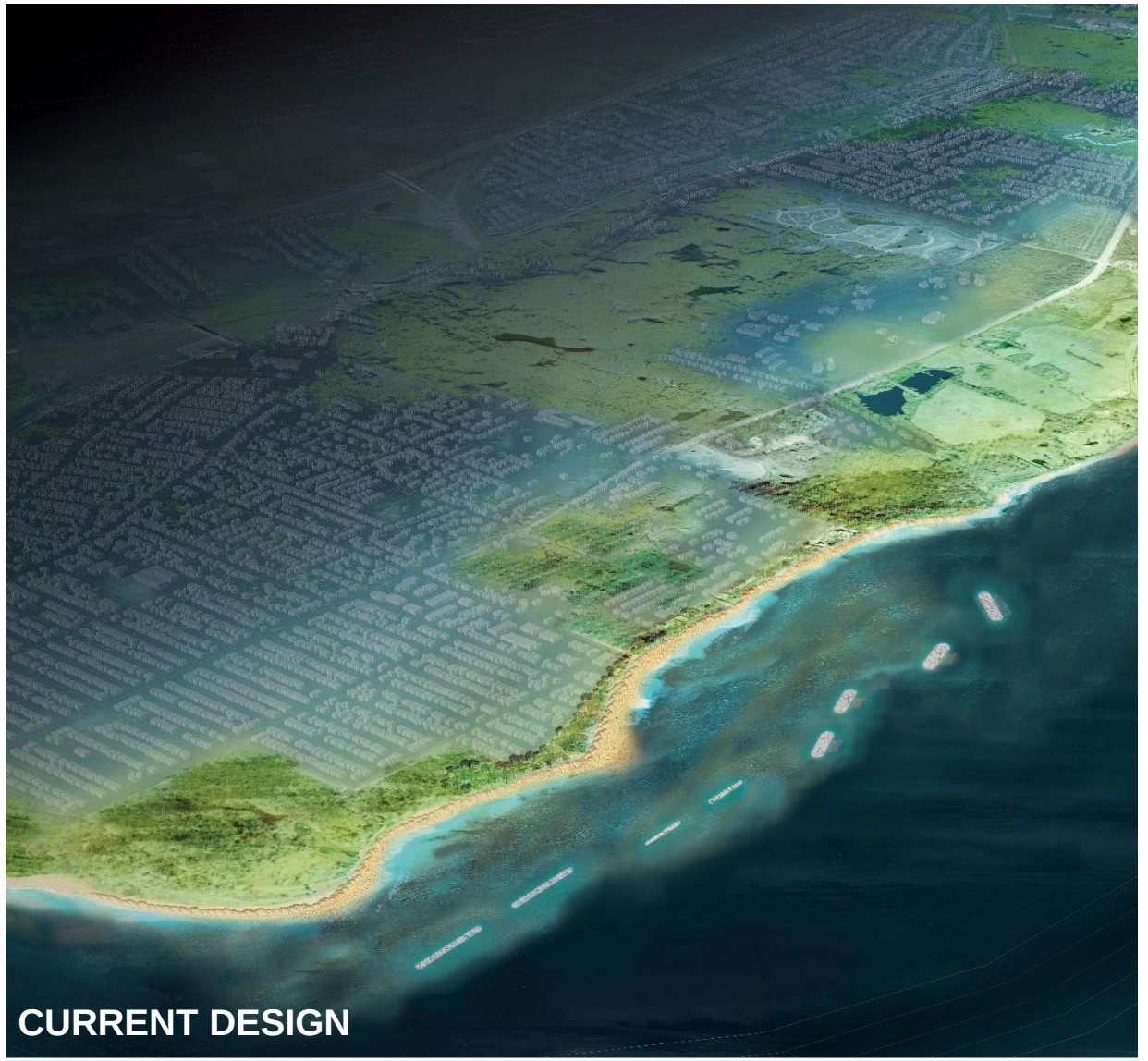


Minor Design Changes

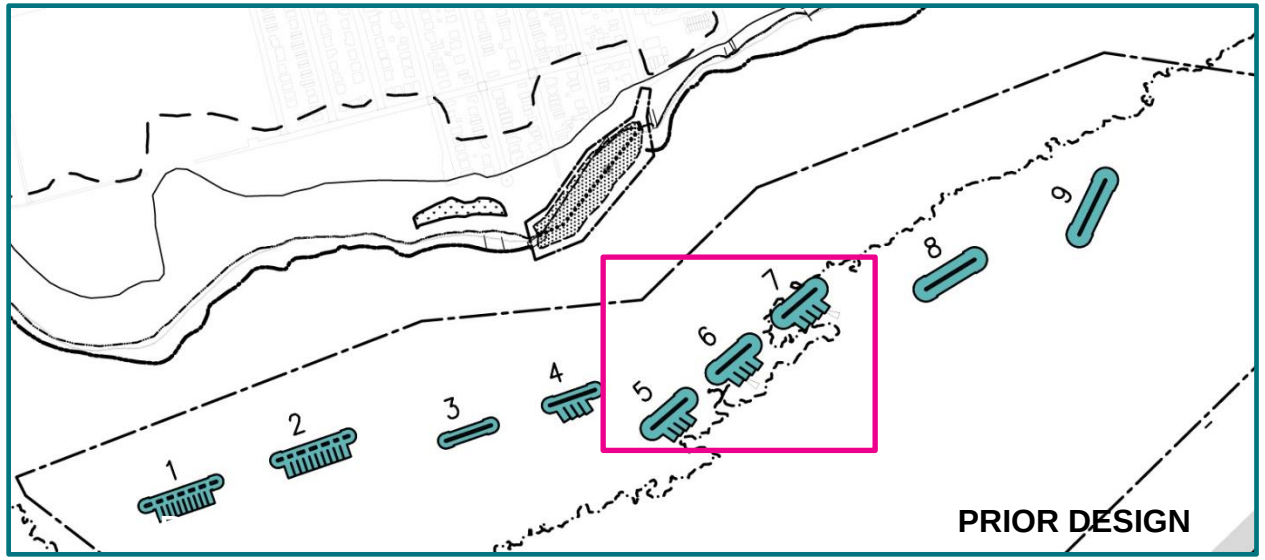
WHAT ARE THE CHANGES?

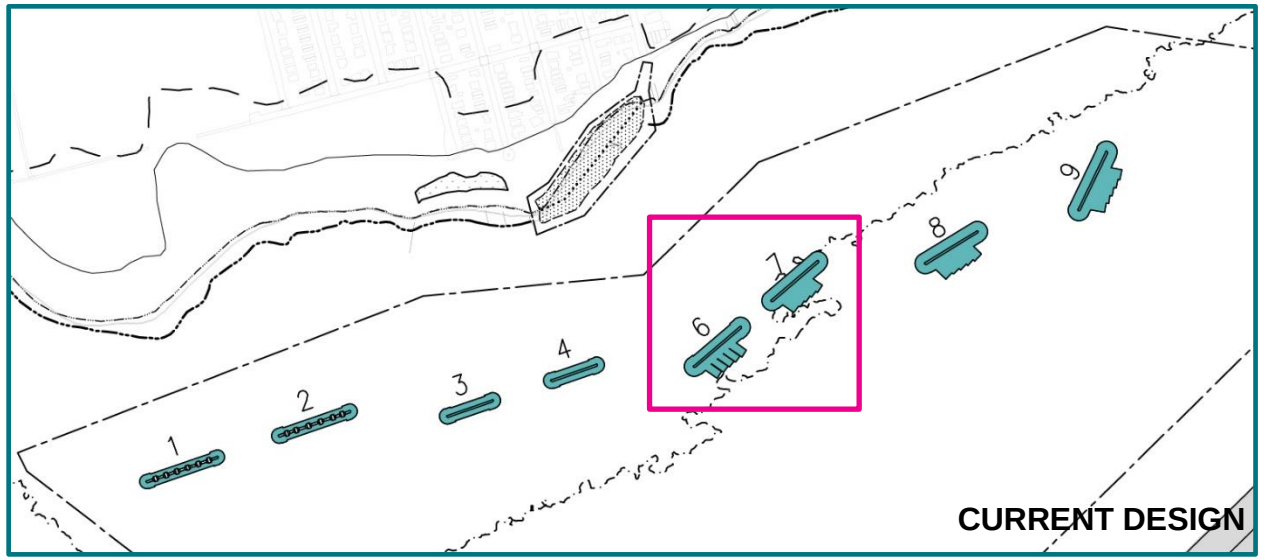




DESIGN CHANGES

- **Eliminated a breakwater by consolidating three breakwaters into two**
- Reduced crest height of tallest breakwaters
- Reduced number of reef ridges and eco-concrete units
- Replaced some structural materials
- Adjusted some seasonal restriction requirements
- Provided additional time (2 years to 4 years)





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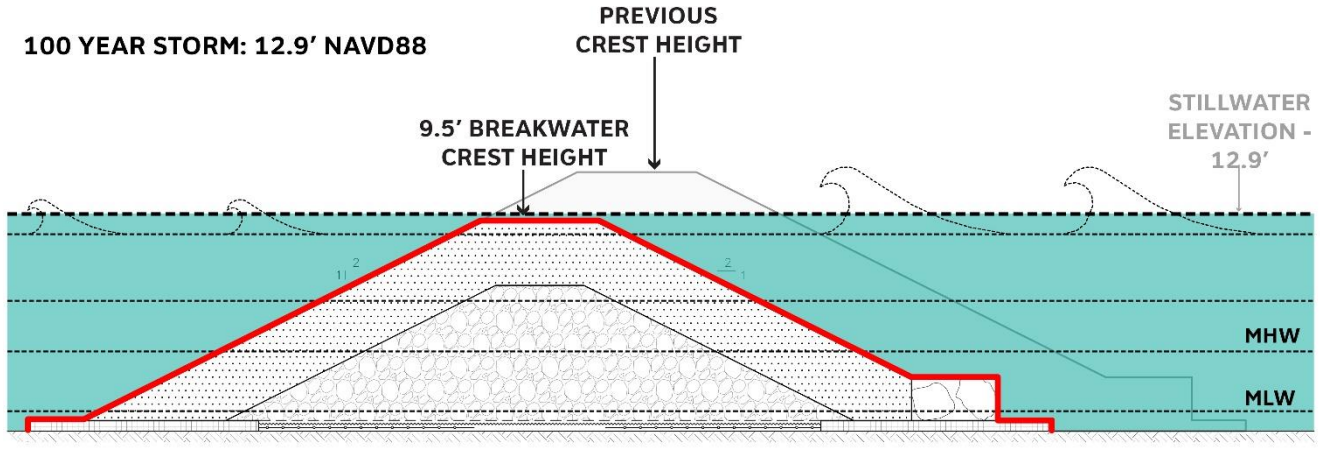

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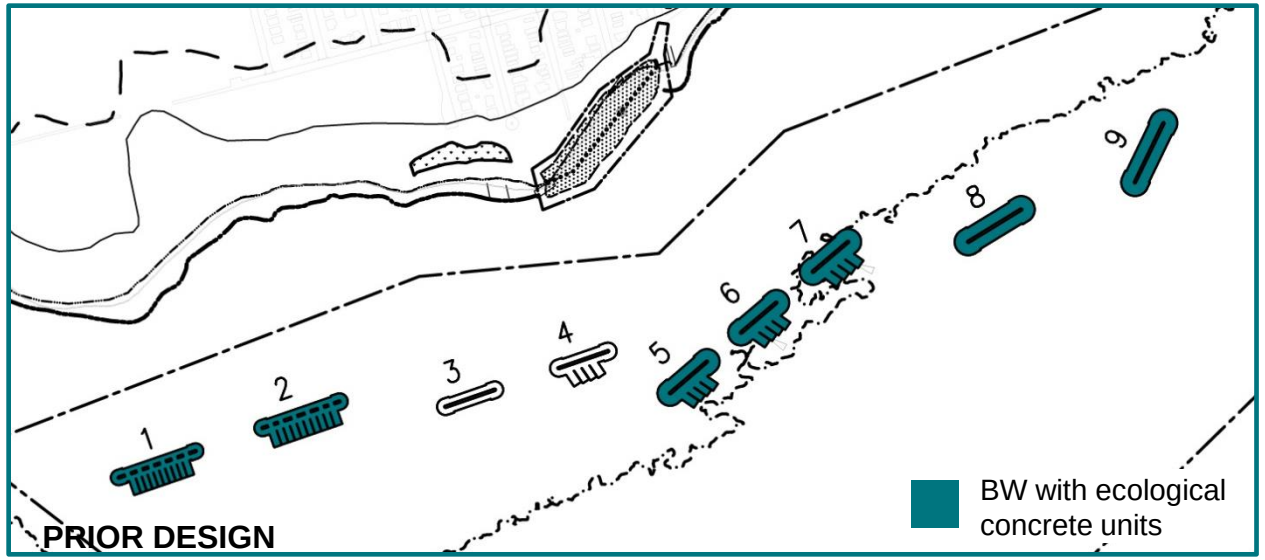

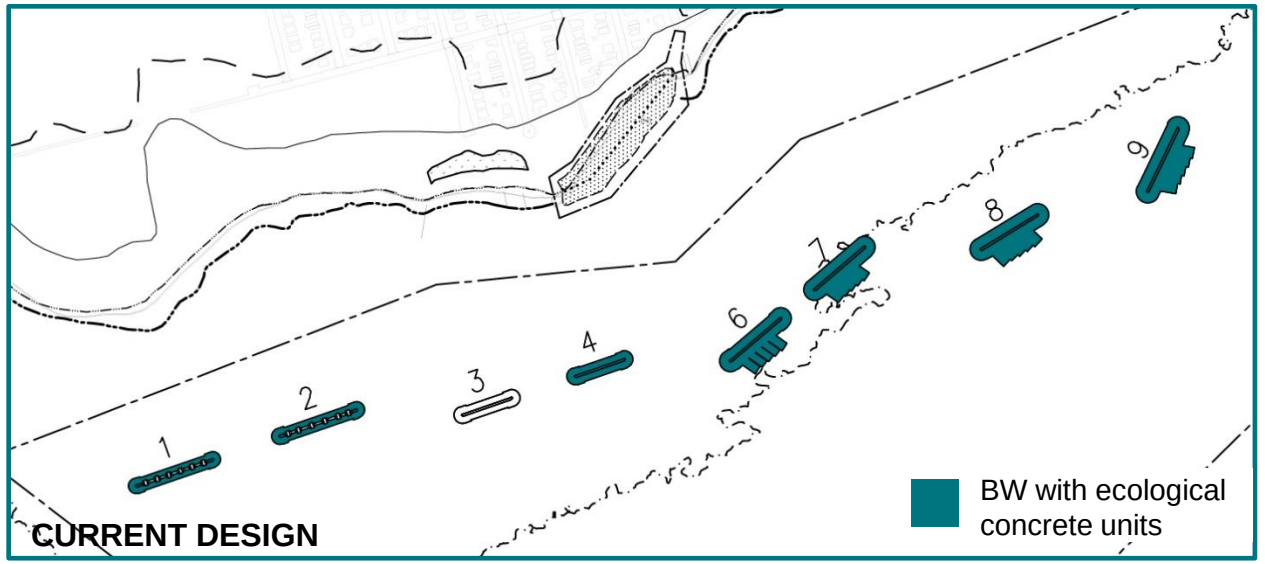

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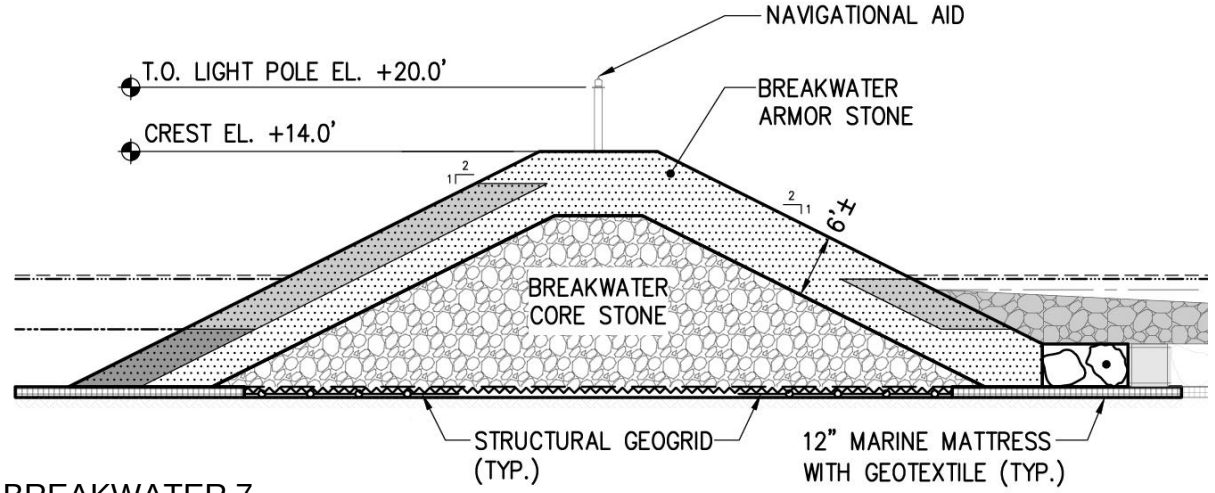
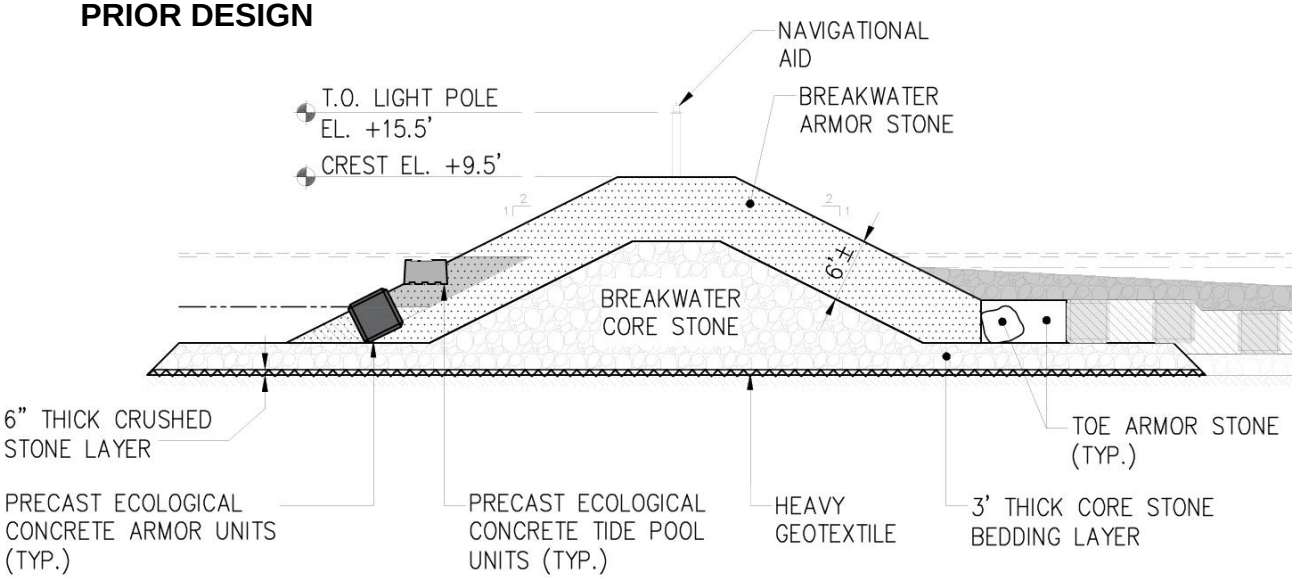


BREAKWATER 7
PRIOR DESIGN



BREAKWATER 7
CURRENT DESIGN

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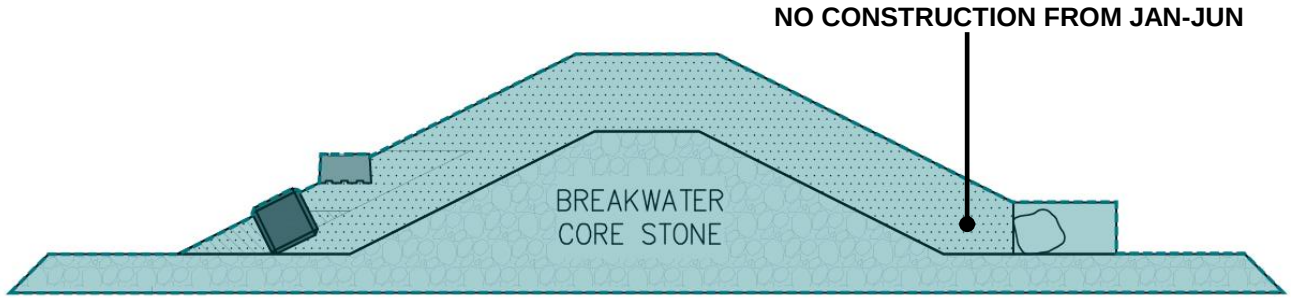
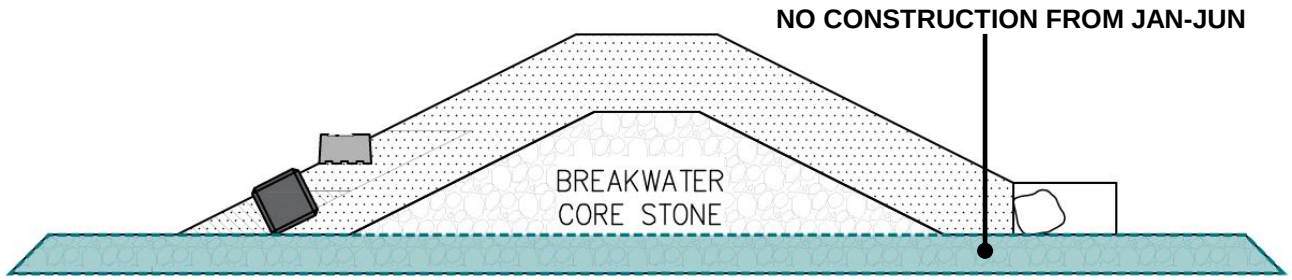


PREVIOUS ASSUMPTION



FINAL PERMIT

DESIGN CHANGES

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- Reduced crest height of tallest breakwaters
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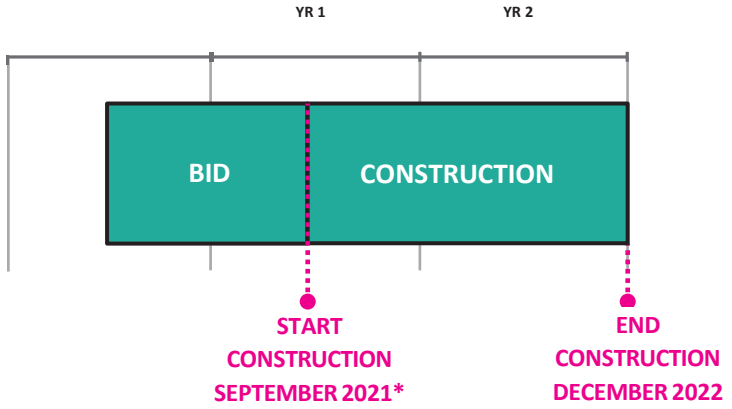
- **Provided additional time for construction (2 years to 4 years)**



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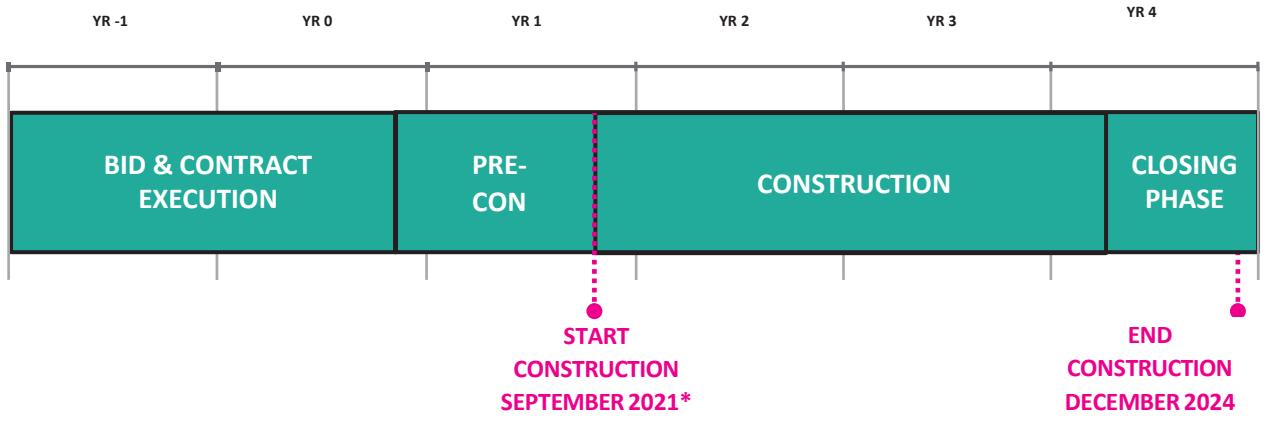
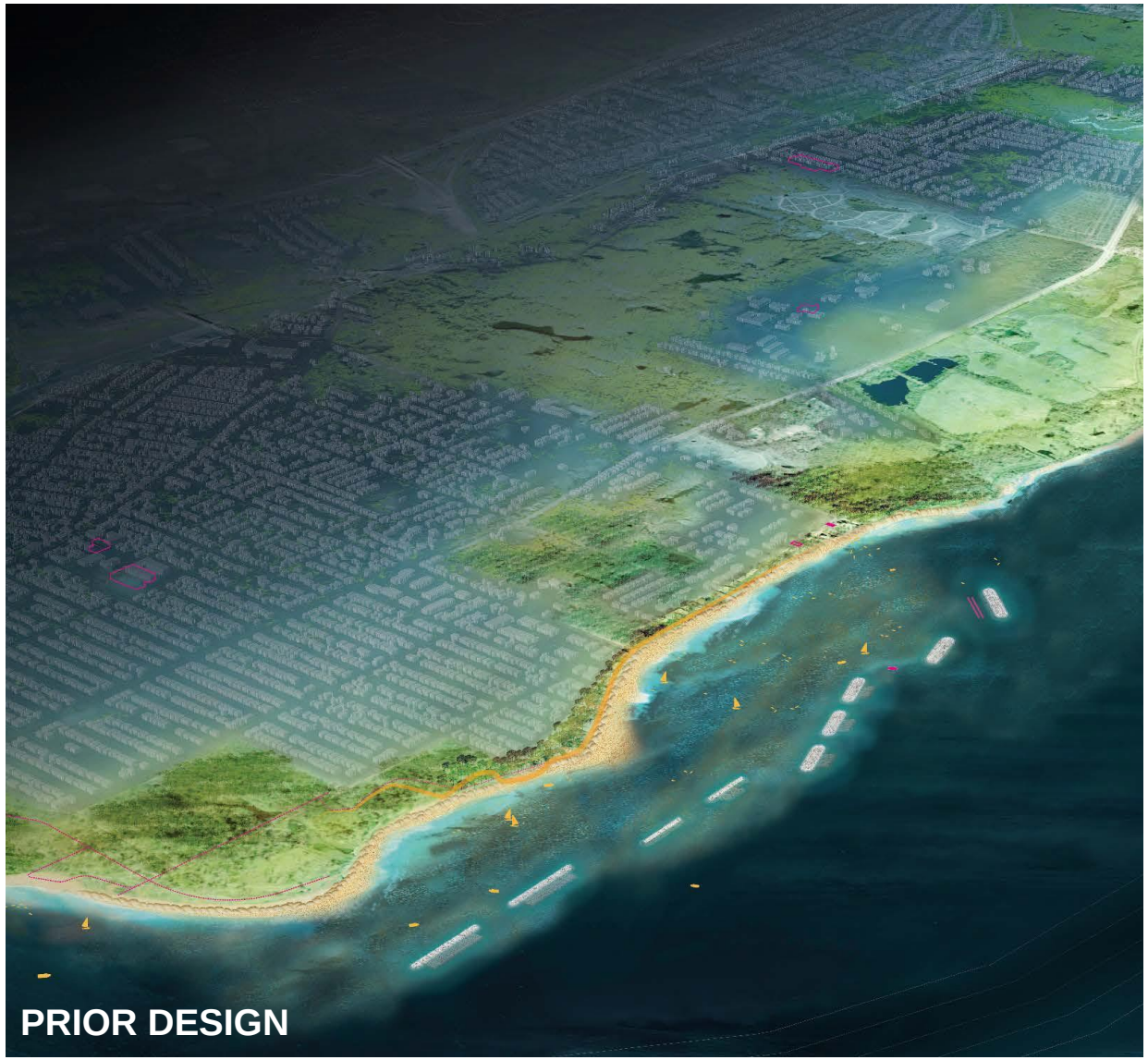
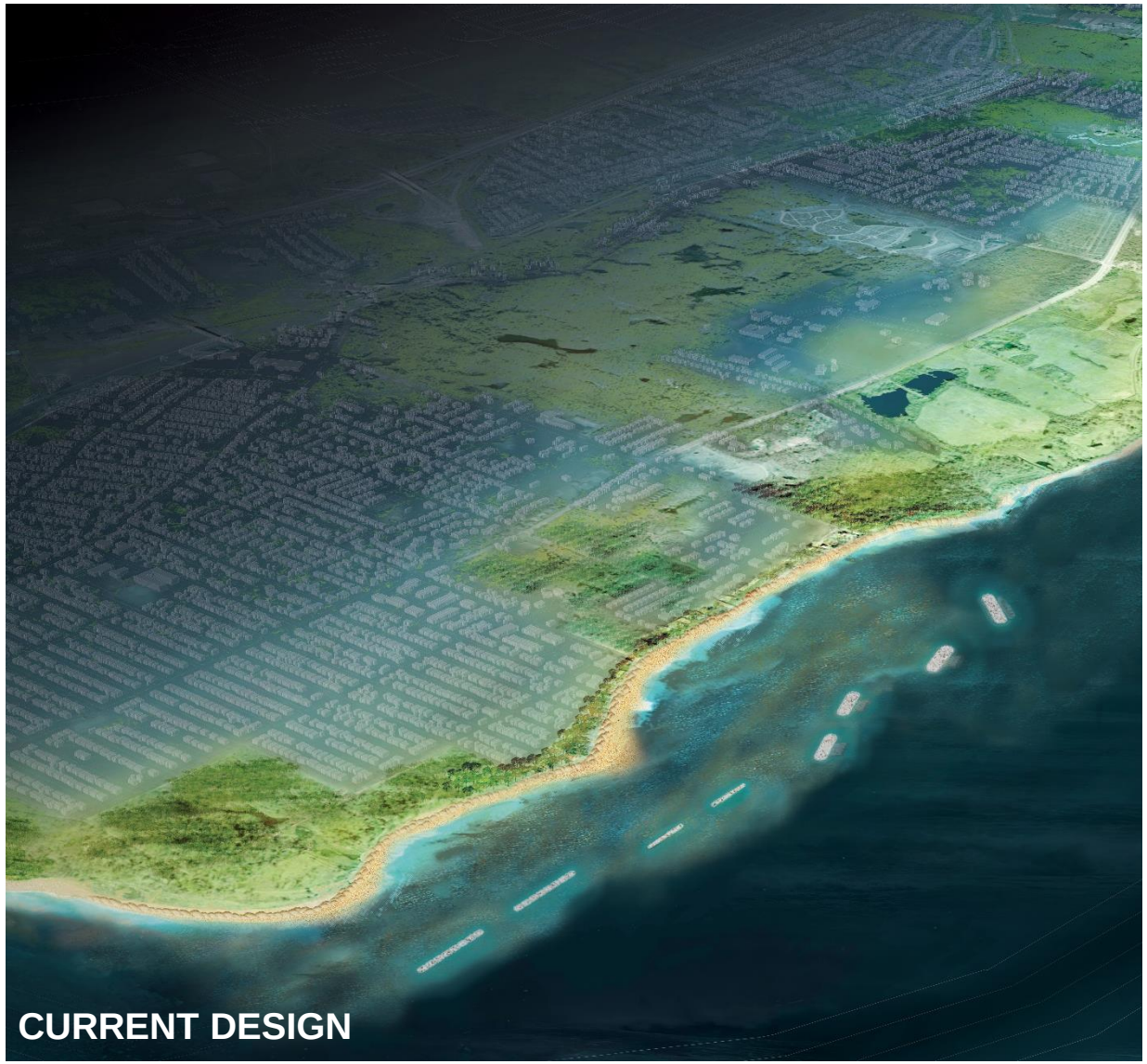


CURRENT DESIGN

*Anticipated construction restrictions:
- No in-water construction Jan 1 to May 31 (Winter Flounder Mating Season)
- No construction on the beach April 15 to July 25 (Horseshoe Crab Mating Season)

DESIGN CHANGES





DESIGN CHANGE RESULTS

- The breakwaters will continue to reduce the height and energy of waves reaching the shore during a 100-year storm event.
- The system will be more effective at combating erosion and building back the beach.
- Their effectiveness at increased storm wave attenuation plateaus at around 18 inches of sea level rise instead of 30 inches of sea level rise.

PRIOR DESIGN

FINAL DESIGN

Budget

BUDGET

1. **Design/Permitting/Planning:**
   $21 million
2. **Construction:**
   $78.7 million
3. **Social Resiliency:**
   $5.2 million
4. **Program Administration:**
   $2.1 million

Total Cost:

$107 million

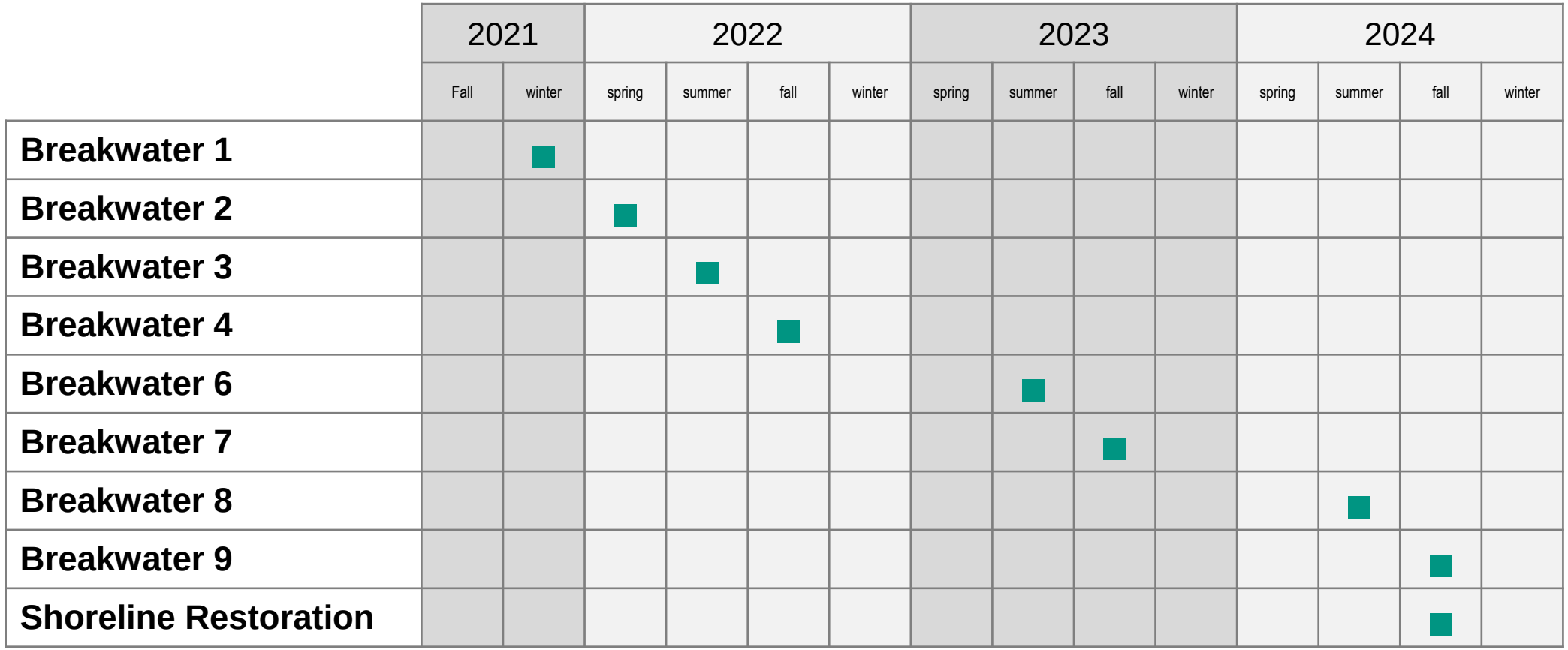
$60 million – HUD CDBG-DR
$47 million – New York State

Construction Schedule

ANTICIPATED CONSTRUCTION TIMELINE

In Water Construction start anticipated to begin between mid-July 2021 and October 2021

Current estimated date for substantial completion of each breakwater:



** Note: there are only 8 breakwaters there is no Breakwater #5*

Tottenville Shoreline Project Update

TOTTENVILLE SHORELINE PROJECT

1. **Current Cost Estimate**
   $44.1 million
   ($39.4 million construction)

2. **GOSR Expenditure to Date:**
   $4.7 million for design

3. **NYC Committed Funds:**
   $19.2 million

4. **FEMA BRIC Application Request (submitted Dec 2020):**
   $19.8 million


THANK YOU!

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CAC MTG
05/XX/21

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- **Total Approximate Estimated Cost Savings**
  million

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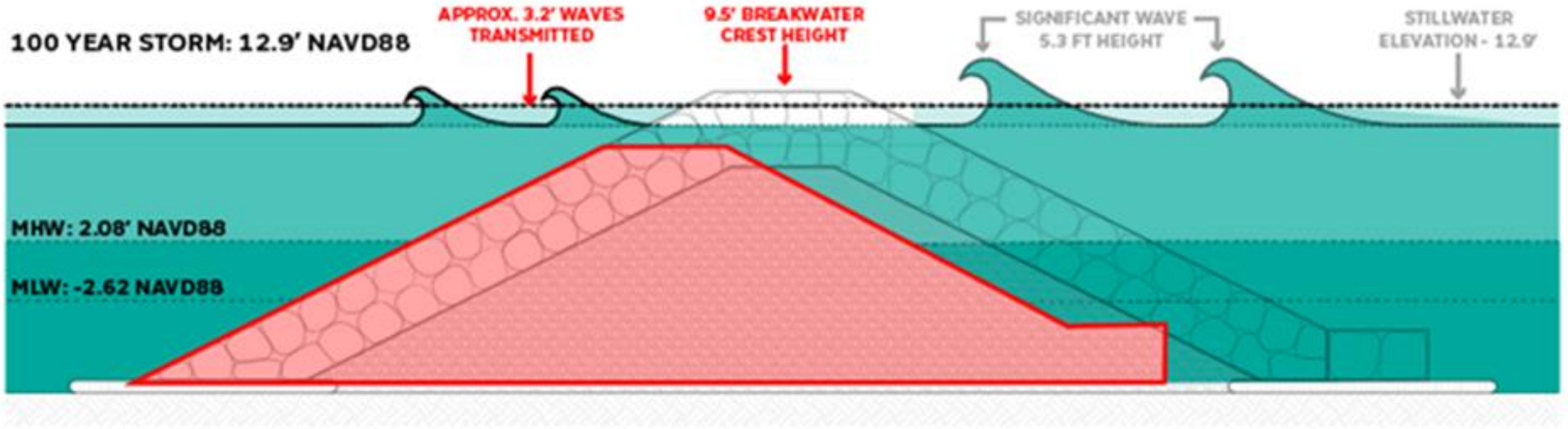

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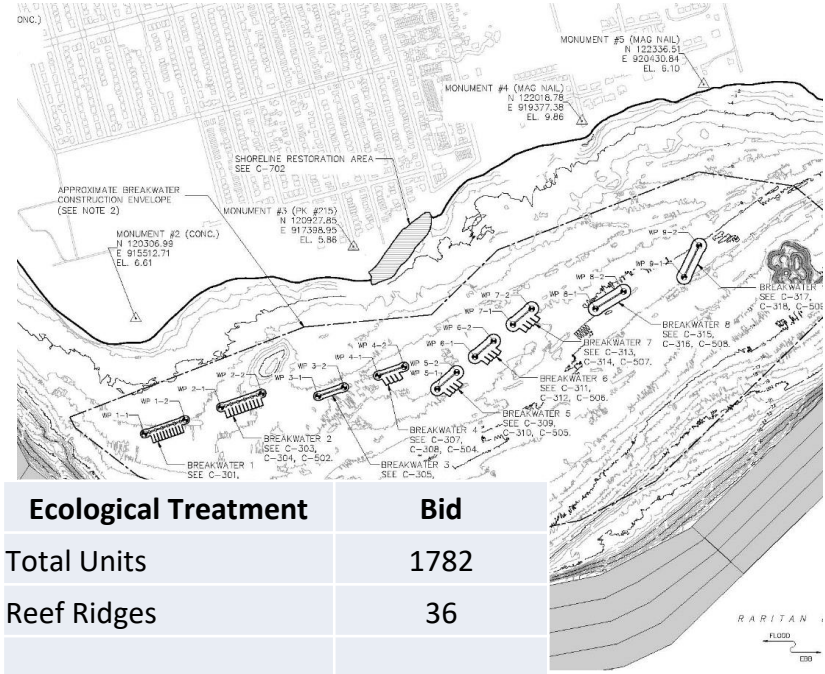
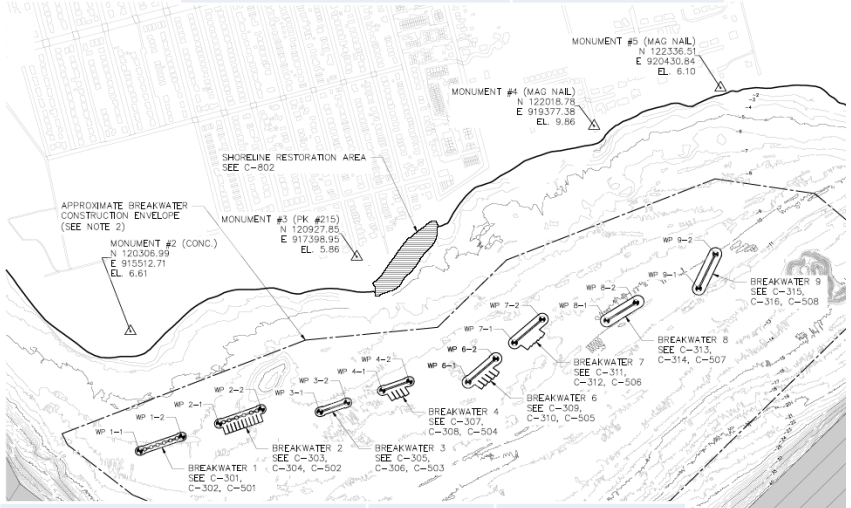


Ecological Treatment	Bid
Total Units	1782
Reef Ridges	36



Ecological Treatment	Rebid	% Reduction
Total Units	1374	22.90%
Reef Ridges	24	33.33%
Total Enhancement		29.63%

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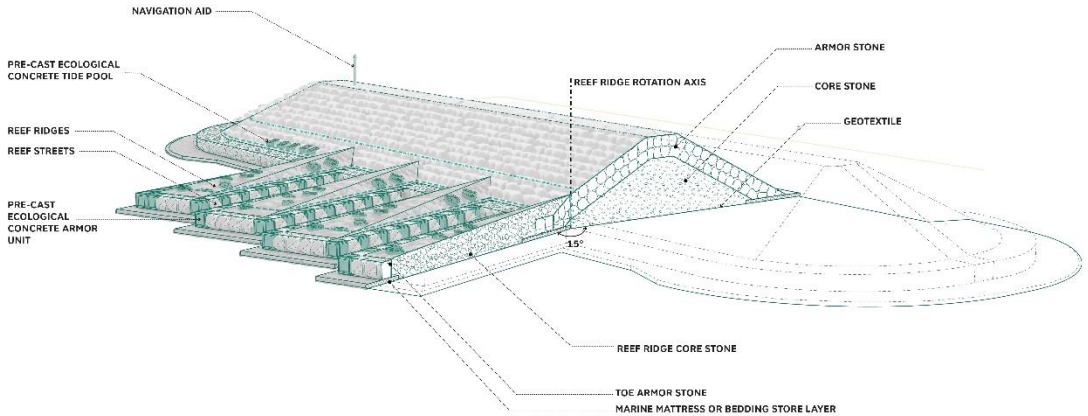
- **Total Approximate Estimate**



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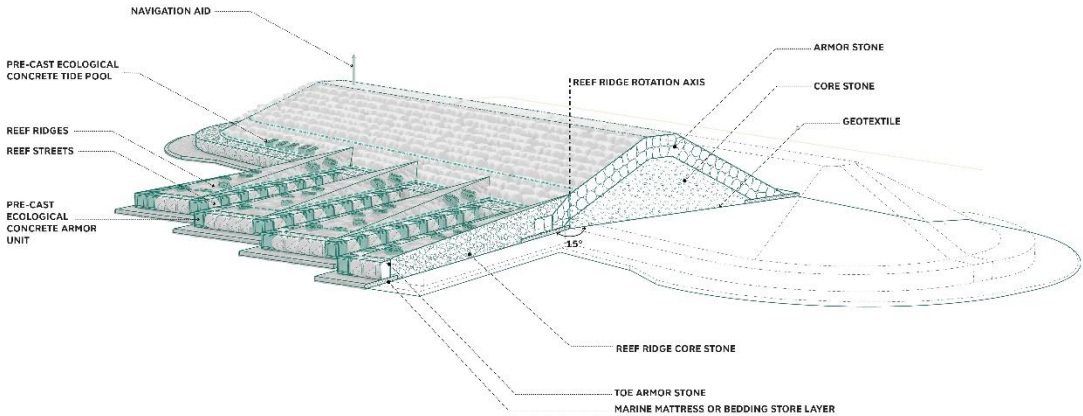

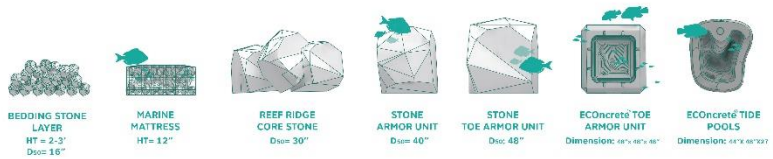

- **Total Approximate Estimated Cost**

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